

IN THE CLAIMS:

Claims 1-16 (Cancelled)

Please amend the following claims:

17. (Currently Amended) A method of photochromically dyeing an optical plastic lens by infusing a photochromic dye into a surface of ~~an~~ the optical plastic ~~article~~ lens having a solubility parameter δ , comprising the steps of:

dissolving a photochromic dye and a plasticizer into an aggressive solvent having a solubility parameter δ within plus or minus 1 $(\text{cal}/\text{cm}^3)^{0.5}$ of the solubility parameter δ of the optical plastic ~~article~~ lens to form a solution; ~~and~~

contacting the surface of the optical plastic ~~article~~ lens with the solution; and:-

evaporating the solvent to form a photochromic lens without having the aggressive solvent substantially affect optical transmissivity of the lens.

18. (Currently amended) The method of claim 17, wherein the optical plastic ~~article~~ lens comprises a plastic matrix and the dissolved plasticizer in the solution provides local surface mobility to the plastic matrix.

19. (Cancelled)

20. (Previously amended) The method of claim 17, wherein the surface is contacted with the solution for less than about one minute.

21. (Cancelled)

22. (Currently amended) The method of claim 17, wherein the lens contains a further dye is selected from the group consisting of a cosmetic tinting dye, an infrared absorbing dye, a laser radiation absorbing dye, an ultraviolet absorbing dye and combinations thereof.

23. (Currently amended) The method of claim 17, wherein the photochromic dye and the plasticizer are infused up to about 150 microns deep into the surface.

24. (Currently amended) The method of claim 17, further comprising the step of:
heating the optical plastic ~~article~~ lens to evaporate the solvent, following said contacting step.

25. (Currently amended) The method of claim 24, wherein the optical plastic ~~article~~ lens is heated to a temperature below the glass transition temperature of the optical plastic ~~article~~ lens.

26. (Currently amended) The method of claim 17, wherein the optical plastic lens ~~article~~ comprises polycarbonate and the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

27. (Previously added) The method of claim 26, wherein the plasticizer is selected from the group consisting of polyethyleneglycol dibenzoate, pentaerythritol tetrabenzoate,

dioctyl phthalate, dipropyl phthalate, dimethyl phthalate, dioctyl adipate and dioctyl sebacate.

28. (Cancelled)

29. (Currently amended) The method of claim 17, wherein

the optical plastic ~~article~~ lens is selected from the group consisting of polymethyl methacrylate and polycarbonate-polyester copolymers; and

the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

30. (Previously added) The method of claim 29, wherein the plasticizer is selected from the group consisting of polyethyleneglycol dibenzoate, pentaerythritol tetrabenzoate, dioctyl phthalate, dipropyl phthalate, dimethyl phthalate, dioctyl adipate and dioctyl sebacate.

31. (Cancelled)

32. (Currently amended) The method of claim 17, wherein the optical plastic ~~article~~ lens comprises polystyrene and the solvent is selected from the group consisting of tetrachloride, methyl isopropyl ketone, and propyl propionate, and combinations thereof.

33. (Previously added) The method of claim 32, wherein the plasticizer is selected from the group consisting of dioctyl phthalate, dipropyl phthalate, and dimethyl phthalate.

34. (Cancelled)

35. (Currently amended) The method of claim 17, wherein the optical plastic ~~article~~ lens comprises polyethylene terephthalate and the solvent is a chlorinated hydrocarbon, and combinations of chlorinated hydrocarbons thereof.

36. (Previously added) The method of claim 35, wherein the solvent is selected from the group consisting of chlorobenzene and chlorostyrene, and combinations thereof.

37. (Previously added) The method of claim 36, wherein the plasticizer is selected from the group consisting of dioctyl phthalate, dipropyl phthalate, and dimethyl phthalate.

38. (Cancelled)

39. (Currently amended) ~~An article~~ A photochromic optical plastic lens having a mixture infused therein by a solvent comprising:

an optical plastic ~~article~~ lens having a surface and a solubility parameter δ ; and

a mixture of a photochromic dye and a plasticizer infused into the surface, with said mixture having been infused while being dissolved in an aggressive solvent having a solubility parameter δ within plus or minus 1 $(\text{cal}/\text{cm}^3)^{0.5}$ of the solubility parameter δ of

the optical plastic ~~article~~ lens, wherein the solvent is evaporated to form the photochromic lens without having the solvent substantially affect optical transmissivity of the lens.

40. (Currently amended) The ~~article~~ lens of claim 39, wherein the optical plastic ~~article~~ lens comprises a plastic matrix and the plasticizer provides local surface mobility to the plastic matrix.

41. (Cancelled)

42. (Cancelled)

43. (Currently amended) The ~~article~~ lens of claim 39, wherein the lens contains a further dye is selected from the group consisting of a cosmetic tinting dye, an infrared absorbing dye, a laser radiation absorbing dye, an ultraviolet absorbing dye and combinations thereof.

44. (Currently amended) The ~~article~~ lens of claim 39, wherein the photochromic dye and the plasticizer are infused up to about 150 microns deep into the surface.

45. (Currently amended) The ~~article~~ lens of claim 39, wherein the optical plastic ~~article~~ lens comprises polycarbonate and the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

46. (Currently amended) The ~~article~~ lens of claim 45, wherein the plasticizer is selected from the group consisting of polyethyleneglycol dibenzoate, pentaerythritol tetrabenzoate, dioctyl phthalate, dipropyl phthalate, dimethyl phthalate, dioctyl adipate and dioctyl sebacate.

47. (Cancelled)

48. (Currently amended) The ~~article~~ lens of claim 39, wherein
the optical plastic ~~article~~ lens is selected from the group consisting of
polymethyl methacrylate and polycarbonate-polyester copolymers; and
the solvent is selected from the group consisting of tetrahydrofuran, a
chlorinated hydrocarbon, and combinations thereof.

49. (Currently amended) The ~~article~~ lens of claim 48, wherein the plasticizer is selected from the group consisting of polyethyleneglycol dibenzoate, pentaerythritol tetrabenzoate, dioctyl phthalate, dipropyl phthalate, dimethyl phthalate, dioctyl adipate and dioctyl sebacate.

50. (Cancelled)

51. (Currently amended) The ~~article~~ lens of claim 39, wherein the optical plastic ~~article~~ lens comprises polystyrene and the solvent is selected from the group consisting of tetrachloride, methyl isopropyl ketone, and propyl propionate, and combinations thereof.

52. (Currently amended) The ~~article~~ lens of claim 51, wherein the plasticizer is selected from the group consisting of dioctyl phthalate, dipropyl phthalate, and dimethyl phthalate.

53. (Cancelled)

54. (Currently amended) The ~~article~~ lens of claim 39, wherein the optical plastic ~~article~~ lens comprises polyethylene terephthalate and the solvent is a chlorinated hydrocarbon, and combinations of chlorinated hydrocarbons thereof.

55. (Currently amended) The ~~article~~ lens of claim 54, wherein the solvent is selected from the group consisting of chlorobenzene and chlorostyrene, and combinations thereof.

56. (Currently amended) The ~~article~~ lens of claim 55, wherein the plasticizer is selected from the group consisting of dioctyl phthalate, dipropyl phthalate, and dimethyl phthalate.

57. (Cancelled)

58. (Currently amended) A method of ~~dying~~ dyeing a surface of an optical plastic article comprising the steps of:

selecting a solvent which is aggressive to the plastic article based on solubility parameters; , wherein each solubility parameter δ is measured in $(\text{cal}/\text{cm}^3)^{0.5}$ and wherein

the solubility parameter of the aggressive solvent is within $1 \text{ (cal/cm}^3\text{)}^{0.5}$ of the solubility parameter of the plastic article;

dissolving a dye and a plasticizer into the solvent to form a solution;
infusing the dye and plasticizer into the surface of the plastic article with aggressive solvent enabled penetration; and
evaporating the deeply penetrating solvent assisted by infused plasticizer without substantially affecting the optical transmission characteristics of the optical plastic article.

59. (Previously added) The method of claim 58, wherein the plastic ~~material~~ article comprises a plastic matrix and the dissolved plasticizer in the solution provides local surface mobility to the plastic matrix.

60. (Cancelled)

61. (Previously added) The method of claim 58, wherein the surface is contacted with the solution for less than about one minute.

62. (Previously added) The method of claim 58, wherein the dye comprises a photochromic dye.

63. (Previously added) The method of claim 58, wherein the dye is selected from the group consisting of a cosmetic tinting dye, an infrared absorbing dye, a laser radiation absorbing dye, an ultraviolet absorbing dye and combinations thereof.

64. (Previously added) The method of claim 58, wherein the dye and the plasticizer are infused up to about 150 microns deep into the surface.

65. (Previously added) The method of claim 58, further comprising the step of: heating the plastic to evaporate the solvent, following said contacting step.

66. (Previously added) The method of claim 65, wherein the plastic is heated to a temperature below the glass transition temperature of the plastic.

67. (Previously added) The method of claim 58, wherein the plastic ~~material~~ article comprises polycarbonate and the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

68. (Previously added) The method of claim 67, wherein the plasticizer is selected from the group consisting of polyethyleneglycol dibenzoate, pentaerythritol tetrabenzoate, dioctyl phthalate, dipropyl phthalate, dimethyl phthalate, dioctyl adipate and dioctyl sebacate.

69. (Previously added) The method of claim 68, wherein the dye comprises a photochromic dye.

70. (Currently amended) The method of claim 58, wherein the plastic ~~material~~ article is selected from the group consisting of polymethyl methacrylate and polycarbonate-polyester copolymers; and

the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

71. (Previously added) The method of claim 70, wherein the plasticizer is selected from the group consisting of polyethyleneglycol dibenzoate, pentaerythritol tetrabenzoate, dioctyl phthalate, dipropyl phthalate, dimethyl phthalate, dioctyl adipate and dioctyl sebacate.

72. (Previously added) The method of claim 71, wherein the dye comprises a photochromic dye.

73. (Currently amended) The method of claim 58, wherein the plastic ~~material~~ article comprises polystyrene and the solvent is selected from the group consisting of tetrachloride, methyl isopropyl ketone, and propyl propionate, and combinations thereof.

74. (Previously added) The method of claim 73, wherein the plasticizer is selected from the group consisting of dioctyl phthalate, dipropyl phthalate, and dimethyl phthalate.

75. (Previously added) The method of claim 74, wherein the dye comprises a photochromic dye.

76. (Currently amended) The method of claim 58, wherein the plastic ~~material~~ article comprises polyethylene terephthalate and the solvent is a chlorinated hydrocarbon, and combinations of chlorinated hydrocarbons thereof.

77. (Previously added) The method of claim 76, wherein the solvent is selected from the group consisting of chlorobenzene and chlorostyrene, and combinations thereof.

78. (Previously added) The method of claim 77, wherein the plasticizer is selected from the group consisting of dioctyl phthalate, dipropyl phthalate, and dimethyl phthalate.

79. (Previously added) The method of claim 78, wherein the dye comprises a photochromic dye.